

AMENDMENTS TO THE CLAIMS

1 1. – 4. (Canceled)

1 5. (Previously Presented) An apparatus in a network element, wherein said network
2 element is any one of a packet router and a data switch operable to manipulate
3 packets at any of Open System Interconnection (OSI) Layer 2 and 3 in a network, the
4 apparatus comprising:
5 a directory enabling element operable under control of an operating system of the
6 network element, wherein the directory enabling element is configured to
7 query, access, and update directory information that is managed by a directory
8 service of the network that includes the network element, wherein the
9 directory service is any one of a Lightweight Directory Access Protocol
10 (LDAP) directory and an X.500 directory;
11 an application programming interface coupled to the directory enabling element and
12 configured to receive directory services requests from application programs
13 and provide the directory services requests to the directory enabling element,
14 wherein the application programs are hosted in the network element;
15 a locator service coupled to the directory enabling element and accessible using the
16 application programming interface and configured to enable the application
17 programs to locate servers that provide the directory services in the network;
18 and

19 a bind service in the directory enabling element and coupled to a security protocol
20 and configured to bind an external application program to the security
21 protocol.

1 6. (Previously Presented) An apparatus as recited in Claim 5, further comprising a
2 Unicode translation service configured to query, access, and update directory
3 information that is encoded in a Unicode international character format.

1 7. (Previously Presented) An apparatus in a network element, wherein said network
2 element is any one of a packet router and a data switch operable to manipulate
3 packets at any of Open System Interconnection (OSI) Layer 2 and 3 in a network, the
4 apparatus comprising:

5 a directory enabling element operable under control of an operating system of the
6 network element, wherein the directory enabling element is configured to
7 query, access, and update directory information that is managed by a directory
8 service of the network that includes the network element, wherein the
9 directory service is any one of a Lightweight Directory Access Protocol
10 (LDAP) directory and an X.500 directory;

11 an application programming interface coupled to the directory enabling element and
12 configured to receive directory services requests from application programs
13 and provide the directory services requests to the directory enabling element,
14 wherein the application programs are hosted in the network element;

15 a locator service coupled to the directory enabling element and accessible using the
16 application programming interface and configured to enable the application

17 programs to locate servers that provide the directory services in the network;
18 and
19 an event service coupled to the directory enabling element and configured to receive
20 registration of an event and an associated responsive action from an
21 application program, notify the application program when the event occurs,
22 and execute the associated responsive action in response thereto.

1 8. (Canceled)

1 9. (Previously Amended) An apparatus as recited in Claim 5, further comprising a
2 group policy interface coupled to the directory enabling element and configured to
3 receive and update the directory service with one or more definitions of directory
4 services policies that apply to groups of network devices in the network.

1 10. (Previously Presented) An apparatus as recited in Claim 5, further comprising
2 an event service coupled to the directory enabling element and accessible using the
3 application programming interface and configured to receive registration of an
4 event and an associated responsive action from an application program, notify
5 the application program when the event occurs, and execute the associated
6 responsive action in response thereto.

1 11. (Canceled)

1 12. (Previously Presented) An apparatus in a packet router, wherein said packet router is
2 operable to manipulate packets at any of Open System Interconnection (OSI) Layer 2
3 and 3 in a packet-switched network, the apparatus comprising:
4 a directory enabling element operable under control of an operating system of the
5 packet router, wherein the directory enabling element is configured to query,
6 access, and update directory information that is managed by a directory
7 service of the packet-switched network, wherein the directory service is any
8 one of a Lightweight Directory Access Protocol (LDAP) directory and an
9 X.500 directory;
10 a bind service in the directory enabling element and coupled to a security protocol
11 and configured to bind an application program to the security protocol; and
12 an event service coupled to the directory enabling element and accessible using the
13 application programming interface and configured to receive registration of an
14 event and an associated responsive action from an application program, notify
15 the application program when the event occurs, and execute the associated
16 responsive action in response thereto.

1 13. (Canceled)

1 14. (Previously Presented) An apparatus in a data switch, wherein said data switch is
2 operable to manipulate packets at any of Open System Interconnection (OSI) Layer 2
3 and 3 in a packet-switched network, the apparatus comprising:

4 a directory enabling element operable under control of an operating system of the
5 data switch, wherein the directory enabling element is configured to query,
6 access, and update directory information that is managed by a directory
7 service of the packet-switched network, wherein the directory service is any
8 one of a Lightweight Directory Access Protocol (LDAP) directory and an
9 X.500 directory;
10 a bind service in the directory enabling element and coupled to a security protocol
11 and configured to bind an application program to the security protocol; and
12 an event service coupled to the directory enabling element and accessible using the
13 application programming interface and configured to receive registration of an
14 event and an associated responsive action from an application program, notify
15 the application program when the event occurs, and execute the associated
16 responsive action in response thereto.

1 15. (Canceled)

1 16. (Currently Amended) A computer-readable tangible storage medium ~~carrying~~ storing
2 one or more sequences of instructions for a network element, wherein said network
3 element is any one of a packet router and a data switch operable to manipulate
4 packets at any of Open System Interconnection (OSI) Layer 2 and 3 in a network,
5 wherein execution of the one or more sequences of instructions by one or more
6 processors of the network element causes the one or more processors to perform the
7 steps of:

8 creating and storing a directory enabling element operable under control of an
9 operating system of the network element, wherein the directory enabling
10 element is configured to query, access, and update directory information that
11 is managed by a directory service of the network that includes the network
12 element, wherein the directory service is any one of a Lightweight Directory
13 Access Protocol (LDAP) directory and an X.500 directory;
14 binding an application program to a security protocol;
15 creating an event and an associated responsive action that are associated with the
16 application program; and
17 in response to occurrence of the event, executing the responsive action, obtaining
18 policy information from the directory service, and converting the policy
19 information into one or more commands that are executable by the network
20 element.

1 17. (Currently Amended) A computer-readable tangible storage medium as recited in
2 Claim 16, wherein execution of the one or more sequences of instructions by one or
3 more processors causes the one or more processors to perform the further steps of:
4 locating a nearest directory server and binding the application program to the nearest
5 directory server that is located;
6 locating a nearest event server and binding the application program to the nearest
7 event server that is located.

1 18. (Currently Amended) A computer-readable tangible storage medium as recited in
2 Claim 16, wherein execution of the one or more sequences of instructions by one or
3 more processors causes the one or more processors to perform the further steps of:
4 translating the policy information into one or more values that are ready to apply to a
5 router, whereby a virtual private network is created between the router and
6 another network device.

1 19. (Currently Amended) A computer-readable tangible storage medium as recited in
2 Claim 16, wherein execution of the one or more sequences of instructions by one or
3 more processors causes the one or more processors to perform the further steps of:
4 translating the policy information into one or more values that are ready to apply to a
5 set of internal data structures of a router, by calling one or more internal NOS
6 API functions, whereby a dynamic IPSEC configuration is created that
7 connects the router and at least one other network device.

1 20. (Currently Amended) A computer-readable tangible storage medium as recited in
2 Claim 16, wherein execution of the one or more sequences of instructions by one or
3 more processors causes the one or more processors to perform the further steps of
4 establishing an application programming interface coupled to the directory enabling
5 element and configured to receive directory services requests from application
6 programs and provide the directory services requests to the one or more processors.

1 21.-22. (Canceled)

1 23. (Previously Presented) A system comprising a network element enabled to
2 automatically interface with directory services in a network, wherein the network
3 element is any one of a packet router and a data packet switch operable to manipulate
4 packets at any of Open System Interconnection (OSI) Layer 2 and 3 in the network,
5 wherein the network element comprises:
6 a directory enabling element operable under control of an operating system of the
7 network element, wherein the directory enabling element is configured to
8 query, access, and update directory information that is managed by directory
9 services of the network that includes the network element, wherein the
10 directory services include at least one of a Lightweight Directory Access
11 Protocol (LDAP) directory and an X.500 directory; and
12 a locator service coupled to the directory enabling element and configured to locate
13 servers that provide the directory services in the network;
14 wherein the network element obtains policy information from the directory services
15 and updates the directory service.

1 24. (Previously Presented) The system of Claim 23, wherein the network element
2 includes a protocol agent for interfacing with the directory services.

1 25.-26. (Canceled)